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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/577,159	12/06/2006	Veronique Sousa	290297US2PCT	3058

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EXAMINER
ROLAND, CHRISTOPHER M

ART UNIT	PAPER NUMBER
2893	

NOTIFICATION DATE	DELIVERY MODE
02/09/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/577,159	SOUSA ET AL.	
	Examiner	Art Unit	
	Christopher M. Roland	2893	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 September 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *20-27 and 29-39* is/are pending in the application.

4a) Of the above claim(s) *26,27,30 and 34-38* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *20-25,29,31-33 and 39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 April 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of the Claims

1. Amendment filed 30 September 2008 is acknowledged. **Claim 28** has been cancelled. **Claims 20, 21, 29, and 32** have been amended. **Claim 39** has been added. **Claims 20-27 and 29-39** are pending. **Claims 26, 27, 30, and 34-38** remain withdrawn from consideration.

Claim Objections

2. **Claim 20** is objected to because of the following informalities: the claim introduces the outmost areas without the qualifier, "passive," as used subsequently through the claims. The outmost areas should be introduced as, "passive outmost areas." Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. **Claims 20-24, 29, 31-33, and 39** are rejected under 35 U.S.C. 103(a) as being unpatentable over Holmberg (US Patent 4,177,475, hereinafter Holmberg '475) of record in view of Petrov et al. (US Patent 4,314,256, hereinafter Petrov '256).

With respect to claim 20, Holmberg ‘475 teaches (FIG. 3) a phase-change memory cell substantially as claimed, comprising:

between two electrical contacts (23 and 24), a portion in a memory material with an amorphous-crystalline phase-change and vice versa, as a stack (28-30) with a central area (29) located between two outmost areas (28 and 30) (col. 5, ln. 7-58); and

each passive outmost area being made in a material having a melting temperature higher than that of the material of the active central area, the material of the outmost areas having very low solubility or zero solubility in the material of active central area, the material of the passive outmost areas having at least one chemical element in common with the material of the active central area, the passive outmost areas being made in a same material (col. 5, ln. 7-58).

Thus, Holmberg ‘475 is shown to teach all the features of the claim with the exception of an interface, inert or quasi-inert from a physico-chemical point of view, between the active central area and each passive outmost area.

However, Petrov ‘256 teaches a chalcogenide memory material having an inert separation layer of, for example, antimony thereon to prevent the interaction of other layers with said chalcogenide memory material (col. 2, ln. 60 – col. 3, ln. 17).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed the passive outmost areas of Holmberg ‘475 of a material that forms an interface, inert or quasi-inert from a physico-chemical point of view, between the active central area and each of said passive outmost areas

as taught by Petrov '256 to prevent the interaction of other layers with said active central area.

Further, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. See *In re Leshin* (125 USPQ 416).

With respect to claim 21, Holmberg '475 and Petrov '256 teach wherein each passive outmost area is made in a material having a thermal conductivity less than or equal to that of the material of the electrical contact which is closest to it (Holmberg '475, col. 5, ln. 7-58; Petrov '256, col. 2, ln. 60 – col. 3, ln. 17).

With respect to claim 22, Holmberg '475 and Petrov '256 teach wherein the passive outmost areas have, in a crystalline phase, an electrical resistance less than or equal to that of the active central area in a crystalline phase (Holmberg '475, col. 5, ln. 7-58; Petrov '256, col. 2, ln. 60 – col. 3, ln. 17).

With respect to claim 23, Holmberg '475 and Petrov '256 teach wherein each passive outmost area is made in a material promoting a phenomenon of formation of crystalline germs in the active central area in proximity to the interface (Holmberg '475, col. 5, ln. 7-58; Petrov '256, col. 2, ln. 60 – col. 3, ln. 17).

With respect to claim 24, Holmberg '475 and Petrov '256 teach wherein each passive outmost area is made in a material substantially of the same chemical nature but with a different composition from those of the material of the active central area (Holmberg '475, col. 5, ln. 7-58; Petrov '256, col. 2, ln. 60 – col. 3, ln. 17).

With respect to claim 29, Holmberg ‘475 teaches further comprising an electrically insulating material (27), wherein the active central area is at least partially confined laterally by the electrically insulating material (col. 5, ln. 7-58).

With respect to claim 31, Holmberg ‘475 teaches wherein at least one of the passive outmost areas and the active central area coincide laterally (col. 5, ln. 7-58).

With respect to claim 32, Holmberg ‘475 teaches further comprising an electrically insulating material (27), wherein at least one of the passive outmost areas is bordered with the electrically insulating material (col. 5, ln. 7-58).

With respect to claim 33, Holmberg ‘475 and Petrov ‘256 teach a memory including a plurality of memory cells according to claim 20 as claimed (Holmberg ‘475, col. 5, ln. 7-58; Petrov ‘256, col. 2, ln. 60 – col. 3, ln. 17).

With respect to claim 39, Holmberg ‘475 and Petrov ‘256 teach wherein each passive outmost area is made in a material having a thermal conductivity less than or equal to that of the material of the active central area (Holmberg ‘475, col. 5, ln. 7-58; Petrov ‘256, col. 2, ln. 60 – col. 3, ln. 17).

4. **Claim 25** is rejected under 35 U.S.C. 103(a) as being unpatentable over Holmberg ‘475 and Petrov ‘256 as applied to claim 24 above, and further in view of Tanaka et al. (US Patent Application Publication 2004/0051161, hereinafter Tanaka ‘161) of record.

With respect to claim 25, Holmberg '475 and Petrov '256 teach the device as described in claim 24 including the additional limitation wherein the material of each passive outmost area being antimony or antimony mixed with tellurium with a percentage ranging up to about 2%, these percentages being atomic percentages (Petrov '256, col. 2, ln. 60 – col. 3, ln. 17).

Thus, Holmberg '475 and Petrov '256 are shown to teach all the features of the claim with the exception of wherein the material of the active central area includes between about 16% and 30% of tellurium and between about 84% and 70% of antimony.

However, Tanaka '161 teaches a chalcogenide material (12) comprising between about 16% and 30% of tellurium and between about 84% and 70% of antimony ([0046]) as a recording layer in a non-volatile memory that can increase the possible number of data rewriting cycles while lowering power consumption ([0008]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed the active central area of Holmberg '475 and Petrov '256 comprising between about 16% and 30% of tellurium and between about 84% and 70% of antimony as taught by Tanaka '161 as a recording layer in a non-volatile memory that can increase the possible number of data rewriting cycles while lowering power consumption.

Further, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. See *In re Leshin* (125 USPQ 416).

Within purview of one having ordinary skill in the art, it would have been obvious to determine the optimum concentrations of tellurium and antimony. See *In re Aller*, *Lacey*, and *Hall* (10 USPQ 233-237), "It is not inventive to discover optimum or workable ranges by routine."

Response to Arguments

5. Applicant's amendments to claims 29 and 32 are sufficient to overcome the objections to claims 29 and 32 made in the non-final rejection filed 31 March 2008. The objections to claims 29 and 32 have been withdrawn.

6. Applicant's amendments to claim 21 are sufficient to overcome the 35 U.S.C. 112 2nd paragraph rejection of claim 21 made in the non-final rejection filed 31 March 2008. The 35 U.S.C. 112 2nd paragraph rejection of claim 21 has been withdrawn.

7. Applicant's arguments with respect to claims 20-25, 29, 31-33, and 39 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Roland whose telephone number is 571-270-1271. The examiner can normally be reached on Monday-Friday, 8:00AM-5:00PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Davienne Monbleau can be reached on 571-272-1945. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C. M. R./
Examiner, Art Unit 2893

/Davienne Monbleau/
Supervisory Patent Examiner, Art Unit 2893